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OPINION

Translocations: Providing Outcomes for Wildlife, Resource Managers, Scientists, and the Human Community

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Abstract

The World Conservation Union (1987) defines a translocation as a release of animals with the intention of establishing, reestablishing, or augmenting an existing population. Despite frequent use as a tool for the management of threatened and endangered wildlife, the full benefits of translocations often go unrealized. In this article, I demonstrate how translocations can achieve outputs for conservation management, conservation science, and the wider human community, using North Island (NI) Saddleback or Tieke (*Philesturnus rufusater*) as an illustrative example. From a conservation management perspective, NI Saddleback have been salvaged from a relic population of less than 500 birds on 484-ha Hen Island to a metapopulation of approximately 6,000 birds on 13 offshore islands and at two mainland New Zealand sites. These translocations have reduced the risk of global extinction for this species and helped restore the ecosystems involved. All these translocations have occurred in the past 42 years from known source populations and with known numbers of birds released. The resulting replicated serial population bottlenecks provide numerous scientific opportunities for conservation and biological research. Although the first Saddleback translocations were to reserves closed to the public, subsequent translocations have been to open reserves, providing the wider human community with an opportunity to see and be actively involved in the management of a threatened endemic species. This has raised the profile of both NI Saddleback and other species and has provided wider community conservation benefits. These three outputs illustrate the value of translocations for resource management and conservation science and for increasing community interest, participation, and investment in biological conservation.

Key words: community involvement, conservation science, *Philesturnus rufusater*, translocation.

Introduction

The World Conservation Union (1987) defines a translocation as a release of animals with the intention of establishing, reestablishing, or augmenting an existing population. Although the underlying premise of a conservation translocation is deceptively simple—animals are reintroduced to historic ranges or introduced to safe conservation areas—the potential benefits beyond establishing a new population are rarely explicitly addressed. And yet, broad support and interest may be critical to the success of any translocation project (Breitenmoser 1998). Sarrazin and Barbault (1996) emphasized the research opportunities provided by translocations, and Seddon et al. (2007) suggested that maximum progress will be made in the emerging field of reintroduction biology through the collaborative efforts of interdisciplinary teams of resource managers and scientists. The World Conservation Union (1995) guidelines for reintroductions call for local community consultation when planning a translocation, but there are few published accounts of how this might occur (Craig 1994; Galbraith & Hayson 1995). Furthermore, I suggest that meaningful community participation should be viewed as one of the primary outputs of a translocation, along with management and scientific objectives, rather than simply part of the planning process.

Resource managers are the traditional instigators of translocations, but reintroduction biologists play an increasingly vital role in research, planning, and implementation (Seddon et al. 2007). However, both resource managers and scientists rely, to varying degrees, on public support for their continued funding and for approval of many translocations. Despite this, scientists are widely criticized for their inability to effectively communicate their research to the general public and, more alarmingly, are often viewed with suspicion (Miller 2005; Meine et al. 2006; Robinson 2006). Resource managers also often suffer from poor public relations in that the news they deliver is often negative (humans are destroying our resources) and authoritative (therefore you cannot go there, touch

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this, harvest that) (Holling & Meffe 1996). Scientists and managers naturally tend to focus on the most interesting and innately satisfying part of the translocation process, that of establishing new populations and investigating the associated questions. But translocations provide opportunities that go beyond immediate management goals and science, opportunities that if ignored, could undermine the support we require from the wider community, and miss the full breadth of our responsibilities as conservation biologists. People increasingly live urban lives of biological poverty (Turner et al. 2004), prompting the argument that advocacy for the natural world may be the most important role of conservation biology (Brussard & Tull 2007). Therefore, I propose that translocation projects are better viewed as multidisciplinary endeavors that deepen understanding and forge valuable relationships among resource managers, reintroduction biologists, and the wider community. I demonstrate this using the North Island [NI] Saddleback or Tieke (*Philesturnus rufusater*), a threatened endemic New Zealand Wattlebird whose conservation and translocation history has provided clear tangible outcomes for these three groups.

NI Saddleback: Conservation Management, Conservation Science, and Community Participation

Conservation Management

The New Zealand Wattlebirds are ancient passerines belonging to the family Callaeatidae (Heather & Robertson 1996). They are represented by the extant NI Saddleback, South Island (SI) Saddleback (*P. carunculatus*), and NI Kokako (*Callaeas wilsoni*), and the extinct SI Kokako (*C. cinerea*) and Huia (*Heteralocha acutirostris*) (Holdaway et al. 2001). They are all forest dwellers, poorly flighted, and have been reduced to remnant populations or extinction through anthropogenic factors (Heather & Robertson 1996). By 1910, the NI Saddleback was reduced to a single population of about 500 birds on 484-ha Hen Island. Although NI Saddlebacks were considered common on the island, it was apparent that a single population was extremely vulnerable to extinction (Merton 1973). Subsequently, there were three attempts to translocate NI Saddleback between 1925 and 1950 (Merton 1973; Lovegrove 1996*b*). These translocations all failed due to difficulties in capturing sufficient numbers of birds, unsuccessful captive maintenance, and/or a limited understanding of the role of predators at release sites (Lovegrove 1996*b*). However, a further attempt in 1964 using mist nets, prerecorded calls, speaker playback systems, improved captive maintenance, and better understanding of release site requirements led to the successful capture and translocation of 23 birds to Whatupuke Island (Merton 1973), resulting in a long-term established population. These techniques have been further refined and used in 30 subsequent translocations to 15 islands and three protected (predator proof fenced with intensive trapping and poisoning regimes) mainland New Zealand sites. There are currently 13 established island populations and 2 at protected mainland locations (see Lovegrove 1996*b*; Hooson & Jamieson 2003, and http://www.massey.ac.nz/~darmstro/nz_projects.htm, for reviews of Saddleback translocations). The extinction risk for NI Saddleback has been drastically reduced by moving from a small island population to a metapopulation of approximately 6,000 birds (Hooson & Jamieson 2003). In addition to this highly desirable management goal, the techniques tested and refined in NI Saddleback populations have been used for the recovery of many other New Zealand bird species (Lovegrove & Veitch 1994), particularly the SI Saddleback (Merton 1973).

Conservation Science

The scientific opportunity presented by NI Saddleback translocations was first realized by Jenkins (1977) who identified the cultural transmission of song patterns and dialects in a translocated population. Subsequent research has exploited individual translocated populations as well as examining effects across the NI Saddleback metapopulation. The translocation history of NI Saddleback is well documented (Fig. 1), detailing founder population size, source population, and date of establishment, and reveals the opportunity for research into some of the most pressing questions in conservation biology, particularly the effect of serial population bottlenecks (Lambert et al. 2005). This provides tremendous opportunity both now and into the future for applied and pure research (Table 1). That is, although there is increasing concern and desire to manage the genetic composition of bottlenecked populations, leaving some populations relatively unmanaged creates research opportunities. Those populations resulting from serial bottleneck events (e.g., Hen–Cuvier–Tiritiri Matangi–Mokoia–Bushy Park) provide opportunities for controlled studies, where the long-term (>100 years) effects may be informative to the recovery of many species. The replicated bottleneck events also provide opportunities for long-term controlled studies into concepts such as "genetic rescue" (Jamieson et al. 2007; Tompkins 2007). In addition to the obvious genetic questions (Table 1), NI Saddleback translocations have also facilitated research on fundamental ecological theory such as density-dependent population growth (Armstrong et al. 2005) as well as applied research on population modeling (Armstrong & Davidson 2006) and release strategies (Armstrong & Craig 1995; Lovegrove 1996*b*) (Table 1). In addition to the published works (Table 1), there is current research at four institutions on the effects of translocation on song development, stress, and sperm morphology.

The Wider Human Community

Early translocations of NI Saddleback were initiated and controlled by the New Zealand Wildlife Service, but

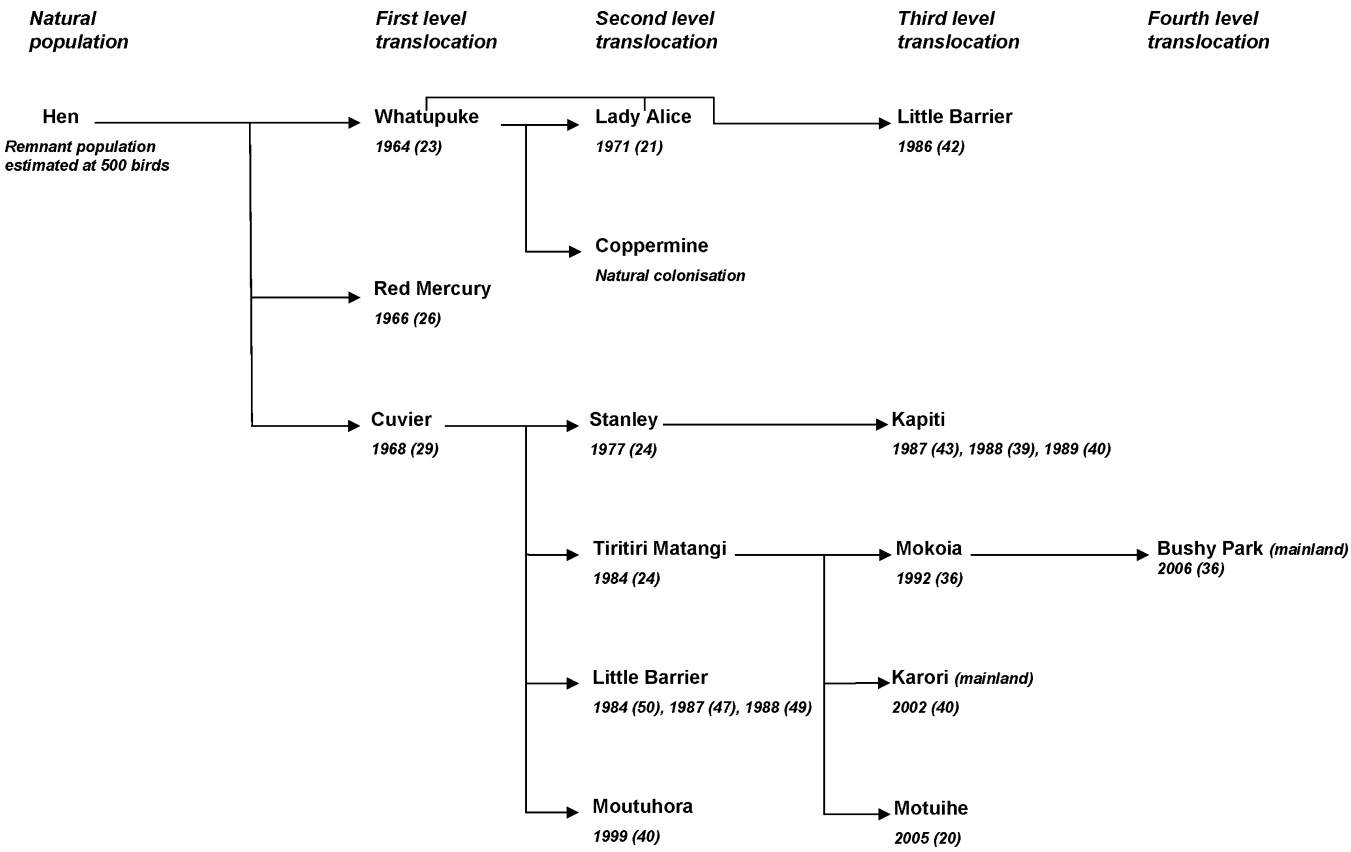

Figure 1. The translocation history of the NI Saddleback showing the years of translocations and the sizes and sources of the founding population. The population on Little Barrier was founded from three different islands (Whatupuke, Lady Alice, and Cuvier) and that on Coppermine is the only example of a natural colonization event. The Kapiti Island population was primarily founded by birds from Stanley Island. However, one bird from Hen, one bird from Lady Alice or Whatupuke, and four birds from Cuvier survived from previous failed translocations (Lovegrove 1996*b*).

volunteers often played important roles in translocation teams (T. G. Lovegrove, 2007, Auckland Regional Council, New Zealand, personal communication). Although these volunteer experiences led many participants to careers in conservation management and science, the early translocations were to island reserves that were closed to the public, so only a privileged few were able to experience NI Saddleback in the wild. However, in 1984, birds were translocated to Tiritiri Matangi Island (Lovegrove 1996*b*; Hooson & Jamieson 2003), a scientific reserve that is open to the public. Although the translocation was carried out by the New Zealand Wildlife Service, it was facilitated by the restoration efforts of volunteer planters and laborers (Rimmer 2004), thereby expanding the role

Table 1. Scientific literature based on translocations of NI Saddleback.

Research Area	*Authors*
Population models for reintroductions	Armstrong and Davidson (2006)
Founder effects	Taylor et al. (2005)
Serial population bottlenecks and genetic variation	Lambert et al. (2005)
Population dynamics and density-dependent effects	Armstrong et al. (2002); Armstrong et al. (2005); Brunton and Stamp (2007); Cassey et al. (2007)
Nest box use in reintroduced populations	Stamp et al. (2002)
The impacts of toxin use for restoration	Spurr (1993); Empson and Miskelly (1999); Davidson and Armstrong (2002)
Release strategies for translocations and conservation status	Armstrong and Craig (1995); Lovegrove (1996*b*); Hooson and Jamieson (2003)
Impacts of rat predation	Lovegrove (1996*a*)
Song development	Jenkins (1977)

Only articles directly related to translocations have been included.

of volunteer to one of habitat restoration and protection. The translocation has been an outstanding success, and birds have successfully colonized most vegetated areas of the island (Craig 1994). The NI Saddleback release was not a public event, but subsequent releases of other species to Tiritiri Matangi have involved the interested public in capture, release, and subsequent monitoring of the translocated animals (Rimmer 2004). Crowds of up to 600 people have attended each release, and releases have received extensive media coverage (Rimmer 2004). The NI Saddleback has gone on to become the emblem of the Tiritiri Matangi Supporters Incorporated, a community group established with the intent purpose of supporting and actively participating in the restoration and maintenance of Tiritiri Matangi Island.

The public involvement in the restoration of Tiritiri Matangi has led to many other community-based restoration projects. Of these, the Karori Wildlife Sanctuary (www.sanctuary.org.nz), the Motuihe Restoration Trust (www.motuihe.org.nz), and Bushy Park Sanctuary (www.bushypark.co.nz) have restored habitat and initiated, funded, implemented, and subsequently monitored NI Saddleback translocations (Fig. 1). These three translocations are unique among NI Saddleback translocations in that they are fully community-based initiatives. Indigenous peoples also often have a strong desire to reassert traditional management of natural resources (Taiepa et al. 1997), and in New Zealand, the gifting of wildlife as a *taonga* (treasure) from one Māori *Iwi* (tribe) to another is a significant event. In addition, Māori approval is a legislative requirement for a translocation to proceed in New Zealand (Department of Conservation 2004). Involvement in Saddleback translocations has often been restricted to blessing the released birds and acknowledgment of movement from one Iwi's *rohe* (area) to another, but there is extensive involvement in planning and monitoring of other species (Moller et al. 2004). Reconnecting people with the natural world is widely acknowledged as one of the greatest challenges facing conservation biology (Leopold 2004; Turner et al. 2004; Balmford & Cowling 2006; Bearzi 2007; Paquette 2007). People develop understanding and empathy from experience (Leopold 2004; Brewer 2006), and these translocations have offered a tangible process for involving, educating, and encouraging the wider community. They provide a continuum of experiential opportunity for people of varying levels of interest, from restoring a site for translocation to capture, release, and contact with the translocated population. During involvement in 15 avian translocations and the associated restoration projects, I have witnessed firsthand the impact they have on participants and visitors, many of whom become passionate advocates for restoration and translocation. In New Zealand, there has been a proliferation of community-initiated restoration projects over the past two decades. The community groups are largely voluntary (Galbraith & Hayson 1995), but they understand the problems and are motivated to act. Their short-term goals may be to reverse and mitigate local degradation, but for many, the long-term motivation is translocation of extirpated species.

Those directly involved in community restoration projects have an obvious sympathy for conservation. But what of those whose involvement is limited to the taxes they pay? Turner et al. (2004) stated that the number and variety of people aware of and involved in the integration of biodiversity must grow. It is here that the media can play an important role, both in educating the general public and as a catalyst for some to seek direct conservation experience and involvement. The media recognize the news worthiness of translocations, the sound bites, and images a welcome antidote to the doom and gloom that is rampant in modern news reports. Despite an increasingly urbanized populace out of touch with the natural world they inhabit, many people respond to animals (Mankin et al. 1999; Muth & Jamison 2000). Therefore, by facilitating media coverage, resource managers, scientists, and community groups can raise both the profile of their particular projects and of conservation as a whole.

Realizing the Synthesis

Although the benefits of viewing translocations as providing multiple outputs are clear, actually implementing the synthesis is challenging. A resource manager's reluctance to relinquish full control of the translocation process may be justified in the face of ill-prepared or premature proposals from scientists, community groups, and even fellow managers. Clear communication of minimum requirements for the successful establishment of new populations is often still lacking and urgently required. Decisions need to be explained and justified, with great care taken to distinguish between scientific or technical issues and value judgments (Lackey 2007). This information will primarily be vertically transmitted from resource managers and scientists to community groups and other scientists. However, expectations need to be communicated in both directions, particularly those of communities adjacent to release sites. Translocations can be seriously compromised by local community opposition, as demonstrated by many attempts to reintroduce large mammals (Breitenmoser 1998), and historically poor communication by resource managers can complicate contemporary translocation efforts (C. M. Miskelly, 2007, Department of Conservation, New Zealand, personal communication).

In contrast to the vertical transmission of biological requirements for a successful translocation, horizontal transmission of funds, labor, motivation, and ongoing commitment can occur across all three groups. Community groups in particular can be a significant source of funding and labor for protecting large tracts of habitat. The New Zealand–based Maungatautari Trust has raised more than 14 million New Zealand dollars for the predator proof fencing and subsequent protection of a 3,363-ha forested site, which will facilitate the translocation of

a diverse range of plant and animal species (www.maungatrust.org). Such community actions have the potential to accelerate the growth of protected areas for restoration and translocation, free of the resource restrictions implicit in government-based efforts. Although promoting the opportunities available for translocation, I do not advocate a complete devolution of traditional structures of resource management. The skills and knowledge required for a successful translocation that are traditionally held by professional resource managers and scientists will always be the main forces behind translocations, particularly of endangered species. However, regardless of who undertakes a translocation, these skills and knowledge are essential for the welfare of the translocated animals and the success of a project.

Translocation is a particularly relevant tool within New Zealand conservation, but similar benefits have been realized in other countries by considering local communities as integral to conservation success. Horwich and Lyon (2007) described 23 projects in nine countries, both developed and developing, where active community participation has been a key component of success. Two of these projects have involved translocations and 15 community groups have formed as a result of others. Large-scale community conservation efforts have been criticized, particularly in developing countries, for not delivering to local communities (Musumali et al. 2007). However, Horwich and Lyon (2007) made a useful distinction between large-scale integrated conservation and development projects and small community-based initiatives. They argue that small-scale community conservation projects that encourage equality, independence, and empowerment represent one of our best chances for conservation success and call for a refocus on low budget, community-scale projects.

Innovation and constant self-assessment are vital for effective conservation management and science. We must actively seek new opportunities for partnerships, participation, and funding not only for translocations but also in all our conservation endeavors, thereby increasing understanding, support, and the effectiveness of our efforts. By loosening traditional views and management structures, and recognizing the diverse politics involved in protecting species, all parties will be prompted to take greater responsibility not only for translocated species but also for habitat restoration and biological conservation in general.

Implications for Practice

- Translocations are best optimized by treating them as multidisciplinary endeavors that deepen understanding and forge valuable relationships among resource managers, scientists, and the general community.
- Increasing community participation and awareness should be viewed as a primary translocation output rather than just a component of the planning process.
- The general public is critical to the success of conservation and restoration and yet are increasingly detached and isolated from the natural world. Translocations provide a unique opportunity to reconnect.
- Translocations and restoration can be better planned, funded, implemented, and maintained by increasing their broad support base.

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